

Date: Thursday, 9/11/2008 10:15:52 AM  
 User: Chantal Lavoie

## Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: ROUND BILLET 17-4
Job Number	: 41969		
Estimate Number	: 11990		
P.O. Number	:	Part Number	: D6104011
This Issue	: 9/11/2008	S.O. No.	:
Prsht Rev.	: NC	Drawing Number	: D6104 REV B
First Issue	: / /	Project Number	: N/A
Previous Run	: 38214	Drawing Revision	: B
	Type : PURCHASED PARTS	Material	:
Written By	:	Due Date	: 9/26/2008
Checked & Approved By	:	Qty:	20 Um: Each
Comment	: Est. A02.12.02 New Issue KJ/RF		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	PG	PURCHASING
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## Comment: PURCHASING

Issue P/O: 7144

a) Description: S.S round billet

b) Ø6.50" x 4.100" long

c) Tolerance on all dimensions are +0.030"/-0.000"

d) Material: 17-4PH Stainless steel

e) Min UTS = 170 KSI (38 HRc)

Material certification required

C208/09/11

2.0	D6104011P	17-4 SS Roundbar 6.50"OD
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 20.0000 Each(s)  
 17-4 SS Roundbar 6.50"OD

3.0	PACKAGING 1	PACKAGING RESOURCE #1
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## Comment: PACKAGING RESOURCE #1

Receive &amp; Inspect For Transit Damage

Ensure material certification is attached

P. 8/9/22 (20)

4.0	QC6	DIMENSIONAL CHECK
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## Comment: DIMENSIONAL CHECK

Ensure Material certification comply to Dwg D6104

MR 08/10/02 20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: 3 PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
				14-14				

**NOTE:** Date & initial all entries

Date: Thursday, 9/11/2008 10:15:52 AM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: ROUND BILLET 17-4

Job Number: 41969

Part Number: D6104011

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: \_\_\_\_\_

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



08/10/06  
mf 08-10-03

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



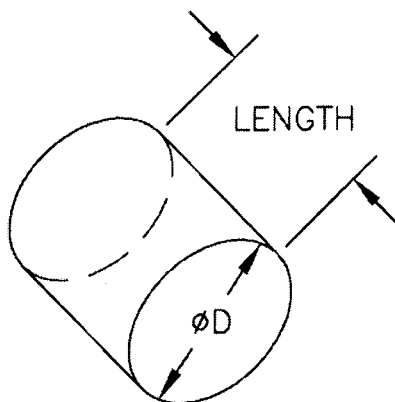
DESIGN D7	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4 SCALE NTS	
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 *[Signature]*

## SPECIFICATION CONTROL DRAWING

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 41969



*W/O 41969*

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRC)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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Specialty Metals  
A Division of Crucible Materials Corporation

NEW YORK 13201

## CERTIFICATE OF TEST

A M CASTLE, INC

S H I P  
A M CASTLE, INC

OUR ORDER NO.

P5-14997-7-R1

3400 N WOLF RD  
FRANKLIN PARK, IL 601313400 N WOLF RD  
FRANKLIN PARK, IL 60131

OB

DATE

03/24/08

CUSTOMER ORDER # &amp; DATE

F01-35652

CUSTOMER REQ. #

DISTRICT

B PARSONS

SHIPPED  
FROM

SYRACUSE

## DESCRIPTION OF MATERIAL

CRU 17-4PH RT A IAC 15003

SIZE  
6.500 RD ✓

AMC-3174-02 REV 26 ASME-SA564-07ED T630 ASTM-A564-04 T630

AMS-2303E AMS-5643R (EX SURF) AISI 630 UNS-S17400

08/10/02

## HEAT NO.

## CHEMICAL ANALYSIS

HEAT NO.	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA
A19833	.041	.55	.030	.023	.49	4.23	15.29	.22	3.24	.28	.011

CASTLE METALS CORP.  
DATE RCVD 4/1/08  
IAC 15003  
APPROVED BY [Signature]

## QUANTITY

## HEAT NO.

## MECHANICAL PROPERTIES

QUANTITY	HEAT NO.	TENSILE PSI	YLD. 2% PSI	%ELONG 4D	RED/AREAZ	HARDNESS BHN 343
2894 #	A19833					

CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL:

208,640	183,400	12.7	44.0	BHN 415
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MACRO TEST OK

MICRO TEST OK

FERRITE 3 %

MAGNAFLUX F/S = 0/0

ELECTRIC FURNACE ADD MELTED

REDUCTION RATIO: 7.6:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 3 HRS 30 MINS AT TEMPERATURE -  
AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18610.

MATERIAL INGOT CAST.

NAFTA - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT

THANK YOU FOR SELECTING A QUALITY PRODUCT

NO WELD REPAIR PERFORMED

MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS IW

MATERIAL MELTED IN U.S.A.

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF \_\_\_\_\_, 20

NOTARY PUBLIC

I.J. WOOLSON - QUALITY ASSURANCE REPRESENTATIVE

CERTIFIED  
BY:

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE  
WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THE  
SPECIFICATION REQUIREMENTS.  
CRUCIBLE MATERIALS CORPORATION  
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

[Signature]  
QUALITY ASSURANCE REPRESENTATIVE



P.O. BOX 977  
SYRACUSE  
NEW YORK 13201

# CERTIFICATE OF TEST

A M CASTLE, INC

SHIP TO

A M CASTLE, INC

OUR ORDER NO.

5-11276-8-0

3400 N WOLF RD

26800 MILES RD

DATE

FRANKLIN PARK, IL 60131

REDFORD HEIGHTS OH 44146

03

05/07/08

CUSTOMER ORDER # &amp; DATE

10-37737

CUSTOMER REQ. #

DISTRICT

B PARSONS

SHIPPED FROM

SYRACUSE

## DESCRIPTION OF MATERIAL

CRU 17-4PH RT A IAC 15003

SIZE 6.500 RD

ANC-3174-02 REV 26 ASME-SA564-07ED T630 ASTM-A564-04 T630

AMS-2303E AMS-5643R (EX SURF) AISI 630 UNS-S17400

## HEAT NO.

## CHEMICAL ANALYSIS

HEAT NO.	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA
A19996	.040	.50	.031	.023	.69	4.15	15.20	.16	3.21	.29	.012

CASTLE METALS CORP.

DATE RCVD 6/11/08  
IAC 15003  
APPROVED BY *[Signature]*

## QUANTITY

## HEAT NO.

## MECHANICAL PROPERTIES

2920 # A19996

TENSILE PSI YLD.2%PSI

ZELONG4D

RED/AREA%

HARDNESS

BHN 352

CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL:

207,130

179,760

12.6

48.9

BHN 415

MACRO TEST OK

MICRO TEST OK

FERRITE 3 %

MAGNAFLUX F/S = 0/0

ELECTRIC FURNACE ADD MELTED

REDUCTION RATIO: 7.6:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 3 HRS 30 MINS AT TEMPERATURE -  
AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18610.

MATERIAL INGOT CAST.

NAFTA - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT

NO WELD REPAIR PERFORMED

MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT

MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS DI

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF 20

NOTARY PUBLIC

I.J. WOOLSON - QUALITY ASSURANCE REPRESENTATIVE

CERTIFIED BY:

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THE SPECIFICATION REQUIREMENTS.  
CRUCIBLE MATERIALS CORPORATION  
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION  
*[Signature]*  
QUALITY ASSURANCE REPRESENTATIVE

A.M. CASTLE &amp; Co. (Canada) Inc.

EXPEDIE 22 SEP. 2008

NO. REQUISITION CLIENT-CUSTOMER REQUISITION NO.

NO. COM. CLIENT-CUST. ORD. NO.  
7144COMPTÉ-ACCT. VEND. SLS TERR.  
91037 200 50

EXPEDIE PAR-SHIP VIA

MANTOUBETH

C.P. CARTAGE

ACHETEUR-PURCHASING AGENT  
LINDA LACELLE

TELEPHONE

613 632-3336

H/C

TAXE

NO. COM ORD

1

C/C

REGION LIVRAISON-DEL ZONE

F.A.B.-F.O.B.

PREPAID

BILL

NO. FEVILLE/EMBALLAGE-B/L NUMBE

R-501399-1

VIVRE A-SHIP TO:

VENDU A-SOLD TO:

DART AEROSPACE LTD

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

INFORMATION CRÉDIT-CREDIT INFORMATION

ROUTE

10-NL-09/

30-NL-09/

31-NL-09/

INSTRUCTIONS/LIVRAISON-DELIVERY  
INQ-183568

INSTRUCTIONS LIVRAISON (CONT.)-DELIVERY (CONT'D.)

INSTRUCTIONS LIVRAISON (CONT.)-DELIVERY (CONT'D.)

DESCRIPTION - ITEM 1

6.5000 RD 17CR-4NI RT SOL TREATED COND A STNLS 4.10"  
GOLD

QTE/UNITE COM.-ORDERED

20 PCS

PCS

POIDS COM.-WT. ORDERE

80

BALLOTS-BUNDLES

PCS/PD EXP. SHIP.

POIDS EXP.-WT. SHIPPED

1

20

801

FORME-SHAPE

I.A.C.

15003

117.180FT

INSTRUCTIONS

TOL + 1/8" - 0

PRIOR DIST/ORD: 10 522802

COULÉE INFO-HEAT INFO QTE-QTY

A19996 ✓ BLUE 7

A19833

13

INSTRUCTIONS (CONT'D.)

20 x 4.10"

08/10/02

2

ENT-V

DESCRIPTION - ITEM 2

TERMS AND CONDITIONS  
OF SALESEE DISCLAIMERS AND LIMITATIONS  
ON THE REVERSE SIDE

INSTRUCTIONS

1 Box

COULÉE INFO-HEAT INFO QTE-QTY

INSTRUCTIONS (CONT'D.)

QTE/UNITE COM.-ORDERED

PCS/PD COM-ORD

POIDS COM.-WT. ORDERED

BALLOTS-BUNDLES

PCS/PD EXP. SHIP.

POIDS EXP.-WT. SHIPPED

FORME-SHAPE

I.A.C.

ENT-W

DESCRIPTION - ITEM 3

ALL EXCEPTIONS FOR SHORTAGE OR DAMAGE MUST BE NOTED  
ON THE DRIVER COPY & CUSTOMER COPY OF THE DELIVERY  
RECEIPTS & SIGNED BY THE DRIVER & CUSTOMER. COPY OF  
SUCH RECEIPT PROPERLY NOTED MUST BE SUBMITTED WITHIN  
10 DAYS WHEN CREDIT IS REQUESTED.

INSTRUCTIONS

10 4912

COULÉE INFO-HEAT INFO QTE-QTY

INSTRUCTIONS (CONT'D.)

QTE/UNITE COM.-ORDERED

PCS/PD COM-ORD

POIDS COM.-WT. ORDERED

BALLOTS-BUNDLES

PCS/PD EXP. SHIP.

POIDS EXP.-WT. SHIPPED

FORME-SHAPE

I.A.C.

ENT-WH

NOM (LETTRE MOULÉE)-NAME (PRINT ONLY)

RECU PAR-RECEIVED BY

DATE RECU-  
DATE RECEIVED

FEVILLE D'EMBALLAGE - PACKING SLIP